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AUTHOR	Drummond, Bob; And Others
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ABSTRACT

A study concerned with the validity of using test data as predictors of student success in various vocational education programs focused on description of the student group in terms of selected variables and on an investigation of the similarities and differences of the groups. Subjects were 519 students representing 12 programs of study (with greatest representations coming from auto mechanics, building trades, and electricity/electronics) from six vocational centers in Maine. Three types of data were gathered: (1) Information about program of enrollment, expected job, retrospective vocational aspirations, and feelings about school gathered by an eight-item questionnaire developed by the authors and completed by the subjects; (2) indicators of academic and intellectual abilities (grade averages and scores on an ability test administered in conjunction with the project); and (3) standardized measures of interests, values, and attitudes related to career development gathered with the Work Values Inventory (WVI), the Ohio Vocational Interest Survey (OVIS), and the Career Maturity Inventory (CMI). Results were found to support the hypothesis that standardized tests differentiate among students in various vocational training programs. It is also concluded that intensive longitudinal studies are essential to a fuller and more useful understanding of the relationship between student characteristics and salient outcomes of education. (The report includes presentation and discussion of all the study's findings.) (LAS)

A Study of the Relationships Between Student Characteristics, "Success" and Course of Study in Selected Voc-Tech Training Programs

Research and Development Project

Conducted Under
Part C and Part D of Public Law 90-576

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Bob Drummond
Keith Cook
Tom Skaggs

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INTRODUCTION

Americans have a tradition of great expectations of their schools and of the educational process. Education has been regarded as the means by which Americans may improve themselves and their society. The Educational Policies Commission (1961) has indicated that "The basic American value, respect for the individual, has led to one of the major charges which the American people have placed on their schools: To foster that development of individual capacities which will enable each human being to become the best person he is capable of becoming. . . ." In decades past, the implementation of the philosophy was quite simple and direct; it was simply assumed that the more years of formal education that one had, the better off he would be. Certainly, the mass media continue to perpetuate this belief as one hears, "To get a good job, get a good education." However, a conflicting value system has emerged. It is well illustrated by the often-heard message, "You don't need a college education to get a good job." This message is obviously aimed at supporting the acceptance and credibility of vocational-technical education as preparation for assuming one of the proliferation of skilled technical jobs in today's market. This plurality of value systems creates a dilemma for a good many of today's young people as they face the questions of -- what they want their education to be, how they wish to get that, and how their education will prepare them for the kind of work they expect to do. No longer is it so clear that "college is the best way". In fact many students who in another era might have attended college are now discovering that a secondary or post-secondary technical education best meets their needs. One should not be hasty in assuming that this decision-making process is an altogether simple one, particularly in light of the bewildering array of alternatives with which a student is sometimes

faced. For some, the thoughts go like this:

> Should I go to college? Perhaps a good technical school would get me the pay I want. . .or I could go in the service and get my training. Maybe I'd better get a job and go to college evenings until I know whether I'll like it. Of course, there's always on-the-job-training at no expense to me, and earnings start right away. But then again, my part-time boss will pay for courses I take at night if I continue to work for him. . . I might be able to imagine myself managing his business someday. . . ."

Moreover, the decision of a Maine student to attend one of the State's regional technical vocational high schools (RTVHS) constitutes only one-half of the process. As indicated in an earlier report (Skaggs, Drummond and Cook, 1972) the directors of many of the regional technical vocational high schools in Maine indicated that they experience some difficult decisions when the demand for enrollment in programs of study becomes so great that they must select students rather than routinely taking all those who seek admission. The frequent dilemma seems to be on the one hand to identify those students who will be the most successful in the program, while on the other hand not rejecting those students for whom such a secondary educational program would be highly beneficial in terms of immediate entry into the world of work. Even though teachers, administrators, and counselors want to admit the very best students possible for their classes, there does exist some real concern that the students for whom the RTVHS's were primarily created might be the very students who get screened out of the program during the admission process.

It is apparent from a review of appropriate professional journals and from numerous "computer searches" that there is a veritable dearth of significant information regarding the relationship between student characteristics and success in Voc-Tech programs. Within even the narrowest definition of "success", graduating from the course of study, the absence of useful literature is apparent.

A study by Skaggs, Drummond, and Cook (1972) describes the current situation and practises in Maine regional technical vocational high schools. The question

of selecting students and the need to predict success does not become important until administrators are faced with more students seeking admission than can be enrolled in a given program of study. There exist various philosophies for dealing with this situation, ranging from the expansion of programs to becoming rigidly selective with respect to admissions. The usual procedure is for the student to make application for enrollment in the RTVHS through his own local high school principal or counselor. The selection process then generally becomes the responsibility of a team composed of personnel from the RTVHS and the "sending schools". There exists some variance in the kinds of data upon which different teams choose to rely, but it is common to find employed such information as past academic performance, school attendance, teacher recommendations, and standardized test data. When test data are included in the procedure, however, it is usually done primarily on the basis of material in the test manual and the user's intuition that the results ought to contribute to the validity of the decision, and not on the basis of empirical evidence which supports such use.

Purpose and Scope of the Study

Recent trends in education emphasize the increasing importance of career choice and development, making it axiomatic that educators therefore become increasingly knowledgeable in the area. The purpose of this study is to contribute to that knowledge.

In general the investigator's research interests balance on the fulcrum of test data as predictors. Practical considerations resulted in the narrowing of these interests to the relationships between certain test data and selected student characteristics. Although much information was obtained by the investigators, it was not feasible for this report to include all possible meaningful analyses.

The paucity of research alluded to earlier suggests that the scope of this study be limited to two major areas:

1) a description of the student group(s) in terms of selected variables,

2) and an investigation of the similarities and differences of the groups.

While this type of reporting does not exhaust the information which may be sifted from the available data, it certainly provides a manageable study from which subsequent useful analyses may be generated. The current study is therefore envisaged as the first in a series of evaluations of the data available.

PROCEDURES

The Sample

In all behavioral research the investigator must deal with the issue of selecting subjects from whom data will be gathered for analysis; this research is no exception. Since the usefulness of many research studies is gauged in part by the extent to which the results are applicable to a larger population, the optimum procedure is to study the entire population. Gathering data in this manner eliminates the problems inherent in generalizing from sample statistics to population parameters. The initial planning of the study therefore encompassed the entire population of concern, students enrolled in vocational technical programs in all of the thirteen RVTHS's in the State of Maine. While use of the entire population was desirable, it became apparent to the investigators that the necessary resources were not available. The population concept was maintained but the number of programs to be studied was reduced. The major thrust of the study would concentrate on the communality programs of Automotive Mechanics (AM), Electricity/Electronics (E/E), and Building Trades (BT). In addition, individual schools would be allowed to test students in other programs as long as funds permitted.

Each of the thirteen schools involved in earlier phases of the study (Skaggs, 1972) was contacted and invited to participate in the data-gathering activity. A total of nine vocational centers agreed to participate in the testing program. A locally relevant program for each school was developed cooperatively by local school officials and project staff. While it was desirable from a research point of view for the same tests to be administered at all schools in each of the common programs, the judgement of local personnel as to which tests would be most appropriate was given priority over methodological rigor. The testing packages were agreed upon and the administration was

tentatively scheduled for the period just prior to the close of the 1973-74 school year. Although nine schools had indicated a willingness to participate, local scheduling conflicts reduced to six the number actually administering the tests. The final data base was therefore composed of 519 students from various training programs. To imply that the results can be interpreted as if the subjects were selected in accordance with strict sampling protocol would be erroneous. It is obvious that the 519 students do not represent a punctiliously selected sample, but rather one selected by circumstance. There is, however, no relevant available information to suggest to the authors that the subjects differ inordinately from the remainder of the population of which they are a part. It is on the basis of this evidence, or lack of it, that the 519 subjects will be construed to represent an acceptable research sample, thus providing a rationale for the use of inferential statistics.

Instrumentation

Collaboration between the investigators and cooperating school personnel resulted in a data-gathering procedure that produced information in each of three areas. The first of these might be labeled "self-report". An eight-item questionnaire was developed by the authors and completed by the sample subjects. The questionnaire elicited information about program of enrollment, expected job, retrospective vocational aspirations, and feelings about school. (See Exhibit A, Appendix.) The second area generated indications of the academic and intellectual abilities of the subjects, including the end-of-year grade average earned in the students' secondary educational career (either vocational courses or all courses) and scores on an ability test administered in conjunction with the project. The third information area included scores on standardized measures of interests, values and attitudes related to career development.

All necessary data-gathering instruments were administered locally by

participating school personnel during the closing weeks of the 1973-74 school year. The tests and related information were then transferred to the authors for scoring and processing. The specific instrumentation, the number of schools providing the data, and the number of students represented appears in Table 1. A list and brief description of the scales of each test employed appears in Table 2 through Table 7. (Complete bibliographic information appears in the Back Notes.)

It should be emphasized that the flexibility of enabling each school to select a meaningful testing program in essence resulted in six different data files. That is to say that all information is not available for all students. A concomitant condition of this procedure is a useable sample size on any given analysis task which is somewhat smaller than the total data base available. While this represents a concession to meticulous research propriety, such compromises become a reality in nearly all applied behavioral research.

Statistical Treatment

The primary data treatment techniques involved the calculations of frequencies and percents for descriptive purposes and simple analysis of variance (ANOVA). All calculations were performed at the University of Maine at Orono's Computer Center via SPSS routines. (Nie, 1970.) The data for the grouping variables for ANOVA applications were obtained from the Student Questionnaire (SQ). (Exhibit A, Appendix.) The SQ items employed dealt with program of enrollment, degree of certainty about wanting to work at job expected upon graduation, and feelings about school. (Additional statistical discussion appears in the text when necessary.)

TABLE 1

Instruments Used W/Number of Schools
and Total Number of Students
Providing Data

Instrument (# of Scales)	No. of Schools	Total # of Students
Analysis of Learning Potential (9)	1	148
Career Maturity Inventory (1)	3	283
Differential Aptitude Test (7)	1	53
Grade Average (N.A.)	5	371
Ohio Vocational Interest Survey (24)	3	202
Otis Lennon Mental Ability Test (1)	3	236
Student Questionnaire (N.A.)	5	439
Work Values Inventory (15)	5	439

TABLE 2

WORK VALUES SCALES AND DESCRIPTIONS*

Scale Name	Description
Altruism	this work value, or goal, is present in "work which enables one to contribute to the welfare of others."
Esthetic	a value inherent in "work which permits one to make beautiful things and to contribute beauty to the world."
Creativity	a value associated with "work which permits one to invent new things, design new products, or develop new ideas."
Intellectual Stimulation	associated with "work which provides opportunity for independent thinking and for learning how and why things work."
Achievement	a value associated with "work which gives one a feeling of accomplishment in doing a job well."
Independence	associated with "work which permits one to work in his own way, as fast or as slowly as he wishes."
Prestige	associated with "work which gives one standing in the eyes of others and evokes respect."
Management	associated with "work which permits one to plan and lay out work for others to do."
Economic Returns	a value or goal associated with "work which pays well and enables one to have the things he wants."
Security	associated with "work which provides one with the certainty of having a job even in hard times."
Surroundings	a value associated with "work which is carried out under pleasant conditions - not too hot or too cold, noisy, dirty, etc."
Supervisory Relations	a value associated with "work which is carried out under a supervisor who is fair and with whom one can get along."
Associates	a value characterized by "work which brings one into contact with fellow workers whom he likes."
Way of Life	associated with the kind of work that "permits one to live the kind of life he chooses and to be the type of person he wishes to be."
Variety	associated with "work that provides an opportunity to do different types of jobs."

* Taken from WVI Manual (c) 1970, Houghton Mifflin

TABLE 3

Ohio Vocational Interest Survey Scales and Descriptions

Scale Name	Description
Manual Work	Unskilled use of tools and routine work usually done by hand.
Machine Work	Operating and adjusting machines used in processing or manufacturing.
Personal Services	Providing routine services for people as a waiter, waitress, usher, household worker, etc.
Caring for People or Animals	Routine work related to the day-to-day needs of people or animals.
Clerical Work	Typing, recording, filing IBM key punching, and other clerical or stenographic work.
Inspecting and Testing	Sorting, measuring, or checking products and materials; inspecting public facilities.
Crafts and Precise Operations	Skilled use of tools or other equipment as in the building trades, machine installation and repair, or in the operation of trains, planes, or ships.
Customer Services	Conducting business relations with people as in retail selling, accepting reservations, receiving payments, or providing information.
Nursing and Related Technical Services	Providing services as a nurse, physical therapist, X-ray or medical laboratory technician, or dental hygienist.
Skilled Personal Services	Providing skilled services to people such as tailoring, cooking, barbering, or hairdressing.
Training	Instructing people in employment or leisure-time activities. Also includes animal training.
Literary	Writing novels, poetry, reviews, speeches or technical reports; editing, or translating.
Numerical	Using mathematics as in accounting, finance, data processing, or statistics.
Appraisal	Determining the efficiency of industrial plants and businesses, evaluating real estate, surveying land, or conducting chemical or other laboratory tests.

TABLE 3 (Continued)

Ohio Vocational Interest Survey Scales and Descriptions

Scale Name	Description
Agriculture	Farming, forestry, landscaping, or the related fields of botany and zoology
Applied Technology	Application of engineering principles and scientific knowledge to the design of structures and machines
Promotion and Communication	Advertising, publicity, radio announcing, journalism, news information service, interviewing, recruiting; also providing legal services as a judge or lawyer.
Management and Supervision	Administrative or supervisory positions, such as a shop foreman, supervisor, school administrator, police or fire chief, head librarian, executive, hotel manager, or union official. Includes owning or managing a store or business.
Artistic	Interior decorating, display work, photography, commercial and creative art work, or artistic restoration.
Sales Representative	Demonstrating and providing technical explanations or products or services to customers selling and installing such products or services, and providing related technical assistance.
Music	Composing, arranging, conducting, singing, or playing instruments.
Entertainment and Performing Arts	Entertaining others by participating in dramatics, dancing, comedy routines, or acrobatics.
Teaching, Counseling, and Social Work	Providing instruction or other services to schools, colleges, churches, clinics, or welfare agencies. Includes instruction in art, music, ballet, or athletics.
Medical	Providing medical, surgical, or related services for the treatment of people or animals.

TABLE 4

Variables in the Attitude Scale of the CMI

Dimension	Definition	Sample Item
Involvement in the choice process	Extent to which individual is actively participating in the process of making a choice	"I seldom think about the job I want to enter."
Orientation toward work	Extent to which individual is task or pleasure-oriented in his attitudes toward work and the values he places upon work	"Work is dull and unpleasant." "Work is worthwhile mainly because it lets you buy the things you want."
Independence in decision making	Extent to which individual relies upon others in the choice of an occupation	"I plan to follow the line of work my parents suggest."
Preference for career choice factors	Extent to which individual bases his choice upon a particular factor	"Whether you are interested in a job is not as important was whether you can do the work."
Conceptions of the choice process	Extent to which individual has accurate or inaccurate conceptions about making a career choice	"A person can do any kind of work he wants as long as he tries hard."

TABLE 5

OLMAT Description of Purpose

The various levels comprising the Otis-Lennon Mental Ability Test series have been designed to provide comprehensive, carefully articulated assessment of the general mental ability, or scholastic aptitude, of pupils in American schools. Emphasis is placed upon measuring the pupil's facility in reasoning and in dealing abstractly with verbal, symbolic, and figural test content sampling a broad range of cognitive abilities. The new Otis-Lennon tests, like the previous editions in the Otis series, were constructed to yield dependable measurement of the "g" or general intellective ability factor. Thus, the single total score obtained at a given level summarizes the pupil's performance on a wide variety of test materials selected for their contribution to the assessment of this general ability factor.

TABLE 6

Analysis of Learning Potential Specific Tests and Descriptions

Scale Name	Description
Test 1: Word Meaning	assess the ability to recognize whether pairs of words are the same, the opposite, or neither in meaning.
Test 2: Number Relations	assess the ability to educe the number relation of two ordered pairs, and to apply this relation in constructing a third ordered pair.
Test 3: Word Categories	devised to sample a variety of reasoning abilities believed to underlie success in a number of school subjects.
Test 4: Spatial Reasoning	measure certain two-dimensional and three-dimensional spatial visualization abilities.
Test 5: Number Fluency	measure facility in performing the basic number operations with two-and three-digit numerals.
Test 6: Number Operations Reasoning	measure insight into the algorithm of a number operation.
Test 7: Word Clues	assess the ability to supply contextual synonyms - an important element in reading.
Test 8: Syntactic Clues	assess generalization of language with respect to morphemes and syntax.

TABLE 7

Differential Aptitute Tests and Descriptions

Scale Name	Description
Verbal Reasoning	Ability to reason with words to understand and use concepts expressed in words.
Numerical Ability	Ability to reason with numbers, to deal intelligently with quantitative materials and ideas.
Abstract Reasoning	A non-verbal, non-numerical measure of reasoning power.
Clerical Speed and Accuracy	Quickness and accuracy in perceiving and marking simple letter and number combinations.
Mechanical Reasoning	Comprehension of mechanical principles and devices, and of the laws of everyday physics.
Space Relations	Ability to visualize, to "think in three dimensions" or picture mentally the shape, size, and position of objects when shown only a picture or pattern.
Spelling	Ability to spell commonly used words.
Language Usage	Ability to distinguish between correct and improper grammar, punctuation, and capitalization.

RESULTS

Student Questionnaire

The Student Questionnaire was administered to students in five of the six participating schools. Of the 439 students responding, 402 were males (92%) and 37 were females (8%), indicating a decidedly male population. The pool of students was nearly equally divided in terms of year in school, with 44% juniors and the remaining 56% seniors. The ages of these students, as indicated in Table 8, were commensurate with other population parameters, the median age being approximately seventeen years, nine months. The students were distributed across twelve different programs of study, with the greatest representations coming from Auto Mechanics, Building Trades, and Electricity/Electronics, as reported in Table 9.

In response to being asked what kind of job they expected to obtain upon graduation, 352 of the 519 students supplied an interpretable response on the item. Each of these responses was placed into one of four categories according to whether the expected job was the same or different from the vocational program of enrollment, and according to whether the anticipated job was at an entry level or at a supervisory/boss level. The results in Table 10 indicate that some 64% of the students expect to be working at a job which is essentially the same as that for which they are training, while the remaining 36% believe that they will work at a different type of job. Although missing values and uninterpretable responses were especially numerous on this item, and could potentially obscure whatever meaning may be present, it should be noted that there is no reason to suspect that any one of the four categories in Table 10 is more susceptable to lost data than any other category. Hence, whatever representativeness may at first glance appear to be lost may not, in fact, be significantly altered. Naturally the degree of certainty which a student experiences with respect to his stated job expectancy may vary considerably from

TABLE

Ages of Students Tested

Age	Frequency	Percent
16	39	9.0
17	167	38.6
18	165	38.1
19	52	12.0
20	9	2.1
21	1	0.2
Totals	433*	100.0

*Data unavailable for remaining 86 students.

TABLE 9

Students' Programs of Enrollment Across Six Schools

Program	Frequency	Percent
Auto Mechanics	93	21.3
Building Trades	66	15.1
Electricity/Electronics	82	18.8
Food Service	7	1.6
Distributive Education	34	7.8
Drafting	34	7.8
Data Processing	8	1.8
Machine/Tool	46	10.5
Conservation	8	1.8
Graphic Arts	16	3.7
General Trades	21	4.8
Heating & Air Conditioning	22	5.0
Totals	437*	100.0

*Data unavailable for the remaining 82 students in the study.

TABLE 10

Students' Job Expectancies Relative to Program of Study and Level of Job.

	Same Job		Different Job	
	Entry level	Boss level	Entry level	Boss level
Frequency	215	10	122	5
Percent	61.1	218	34.7	1.4

TABLE 11

Students' Vocational Aspirations Relative to Program of Study by Progress in School.

Educational Level	Same Job as Program		Different Job	
	N	%	N	%
Elementary	65	23.7	209	76.3
Junior High	128	39.5	196	60.5
Senior High	256	69.8	111	30.2

Note. The total number of cases varies from one educational level to another because of missing and uninterpretable responses.

extreme tentativeness to the utmost positiveness. It is, therefore, important to note that 86.4% of the students indicated that they were either "very certain" or "fairly certain" that the job they expected to obtain was the one that they wanted. In fact, a solid majority (53.3%) indicated that they were "very certain" while only 13.6% said that they were "uncertain" with respect to these job expectations. Assuming that what students say is an accurate representation of their thinking, we can place a substantial degree of credence in the stability of their job plans over time.

Item number 4 on the Student Questionnaire asked the students to identify their primary vocational aspirations during each of three periods in their educational career: elementary grades, junior high, and senior high school. The interest in this item was in identifying the kinds of changes which evolve over time for these vocational technical students. The careers or occupations which were supplied in response to this item were classified according to whether they were essentially the same or different from the job for which the student was preparing. The results in Table 11 reveal a possible trend which, while not unanticipated, is suggestive of a rather orderly flow of changes in vocational plans from elementary school through high school. We would call attention to the fact that nearly 30% of the retrospectively reported elementary school vocational aspirations are the same as the vocation for which the subjects are currently preparing, while roughly 70% of the reported elementary school aspirations are different from their present program of study. By the time these students reached senior high school, the transformation appears to have been such that the 30%-70% split is the converse of that found in elementary school. In other words, 70% of the students report their primary vocational aspiration to be congruent with their present program of study. What appears to be manifest here is what Crites (1973) has called the process

of "vocationalization". In his words,

> . . . the choice of an occupation is a process, not simply a one-time event, which extends from approximately age 10 to age 21 and which progresses through differentiable periods of deliberation culminating in a more or less satisfactory and satisfying compromise between personal needs and occupational realities (pp. 5-6).

An important implication of this process for people such as counselors, administrators, teachers, and parents has to do with the specificity of job decisions which such adults would sometimes wish to demand of the young; namely, that a substantial number of students here have demonstrated the process of vocational changes which they go through even in the few years from junior high school to senior high school. To press for firm decisions prematurely would be to interrupt this process and, thereby, invite increased confusion and conflict rather than clarity in decision-making.

Further substantiation for students planning to enter the occupation for which they are preparing is disclosed from the responses to item 5 on the questionnaire. For this item, once again we find 70% of 436 students responding indicating that they have not prepared for a vocation other than their present choice. Stability and representativeness of the data is indicated by a relatively unchanging percentage rate in spite of a vastly greater number of responses to this item. (The proportion of students whose preparation is fitting with the job they expect to enter was also approximately 70% in Tables 10 and 11.)

Recognizing the significance of parental modeling on child and adolescent development and behavior, the authors sought to find out via the questionnaire the nature of work done by father and/or mother. The occupations which the students reported were then classified into one of seven categories according to Hollingshead's Two Factor Index of Social Position (1957). This data, which is reported in Table 12, indicates that occupationally the students in this

study tend to come from middle and lower middle social status families. The fathers tend to be employed as small independent businessmen or minor professionals, skilled manual workers, or machine operators and semi-skilled workers. As one might suspect, the largest single occupational group represented were the skilled manual employees. This single category accounted for slightly over one quarter of the occupations present and in itself was composed primarily of carpenters, mechanics, and small farm owners. These are all largely "visible" jobs in which students can observe their father's work, and thereby experience the modeling of values, attitudes, and behaviors which are particularly important for the young male seeking an occupational identity. By far the largest single group of mothers were housewives (nearly 42%), and of those who were gainfully employed the largest single group was in the clerical and sales area. Nearly half of those employed within this single category did secretarial, clerical, and stenographic work. Generally speaking, what seemed to be represented here were some rather conventional, traditional occupational role stereotypes for men and women. The men may be characterized as enjoying activities which require physical strength, aggresive action, motor coordination and skill. They prefer dealing with specific, concrete problems rather than those which are abstract and intangible, and would tend to avoid situations requiring verbal and interpersonal skills. Their orientation toward life could be characterized as being realistic, concrete, and practical. The women, on the other hand, would seem stereotypically characterized as filling supportive, responsive, and socially orientated roles in ways that basically conform to the existing social order.

Item number 7 on the questionnaire was responded to by 438 students, 68% of whom expressed basically positive feelings toward school. The reader's inspection of Table 13 will show that by far the greatest percentage of this group had

TABLE 12

Classification of Parents' Occupations

Hollingshead Classification	Father's Occupation N	Father's Occupation %	Mother's Occupation N	Mother's Occupation %
1. Higher Executives, Proprietors or Large Concerns, Major Professionals.	3	0.7	3	0.7
2. Business Mgrs., Proprietors of Medium Concerns, Lesser Professionals.	14	3.3	25	6.1
3. Administrative Personnel, Small Indep. Businesses, Minor Professionals.	67	16.0	19	4.6
4. Clerical & Sales, Technicians, Owners of Little Businesses.	30	7.2	57	14.0
5. Skilled Manual	114	27.3	13	3.2
6. Machine Operators, Semi-skilled	48	11.5	31	7.6
7. Unskilled	23	5.5	22	5.4
8. Housewife	-	-	170	41.6
Retired	6	1.4	-	-
Deceased	7	1.7	-	-
Disabled	14	3.3	-	-
Unable to Classify	92	22.0	69	16.9
Totals	418	99.9	409	100.1

TABLE 13

Summary of Students' Feelings About School.

	Like Very Much	Like	It's OK	Dislike	Dislike Very Much
N	36	92	249	30	31
%	8.2	21.0	56.8	6.8	7.1

TABLE 14

Students' Post-Secondary Education Plans

	Formal Tech. & 2 yr. trng.	4 Year College	Military	On-the-Job Training	Other
N	123	26	34	20	3
%	59.7	12.6	16.5	9.7	1.5

marginally positive feelings toward school by indicating that it was "okay". This data seems to demonstrate that these vocational-technical students are not especially academically orientated, but neither are they "turned off" by school in any substantial numbers. This finding appears further substantiated by the findings from item 8 on the questionnaire, where 52.6% of the students reported that they do plan in some way to continue their education beyond high school. Further investigation of these plans reveals that approximately 60% of those who have some educational plans beyond high school plan for additional formal technical training, in many cases in a two-year technical institute. Moreover, the data in Table 8 shows that nearly 13% of those planning some type of post-secondary education are expecting to enter a four-year college or university. This finding may indeed be remarkable for those vocational directors and counselors who believe that the students they educate are essentially those who will enter the job market immediately upon graduation from high school; here we find that every other student has some type of post-secondary educational plans and for a great many this includes a two or four year institution. This observation carries no implications of criticism, but is rather intended to suggest that those who believe themselves to be engaged primarily in preparing students for immediate entry into the world of work may wish to examine more closely just what their students actually do upon graduation from the RTVHS.

Work Values Inventory (WVI)

The WVI is a 45 item, 15 scale standardized instrument designed as a means to assess the goals and values which motivate persons to work. WVI scales relate to both the extrinsic and intrinsic satisfactions within the work role. It is believed that a clearer understanding of the value structure of an individual and the kinds of rewards realized through various occupational clusters will aid in optimizing the career development sequence. Information regarding

typical value profiles of various job-oriented groups, as well as profiles of persons with differing attitudes toward work and vocational training-related activities, would prove to be potentially useful information in career counseling.

A profile of the results of the sample of 333 vocational technical high school students who took the WVI and also reported their program of enrollment is presented in Figure 1. The means and standard deviations are presented in Table 15. Observational comparisons of their scores to the standardization group of twelfth grade boys is possible by examining Figure 1 and/or Table 15.

For the Maine vocational technical students, Economic Returns was the scale having the highest mean score, followed by Way of Life. Way of Life is associated with the kind of work which "permits one to live the kind of life he chooses and to be the type of person he wishes to be." Security was third, followed by Achievement. Achievement is a value associated with work which "gives one a feeling of accomplishment in doing a job well." The fifth highest scale was Supervisory Relations, a value associated with work which "is carried out under a supervisor who is fair and with whom one can get along." The five lowest values for the Maine vocational technical students were: Esthetics (15), Management (14), Associates (13), Creativity (12), and Intellectual Stimulation (11).

The rank order for the Maine sample as well as for the norming group of twelfth grade boys is presented in Table 16. The top five values are the same for both groups, but their positions are somewhat different. Way of Life was first for the norming group, followed by Economic Returns. Security was third for both groups. Achievement was ranked fourth by the Maine sample but fifth by the norming group. Supervisory Relations was fourth for the norming group but fifth for the Maine students. The rank order for the bottom three is the

Figure 1: Profile of WVI Scale Scores for Study Sample and Twelfth Grade Boys in Norming Group

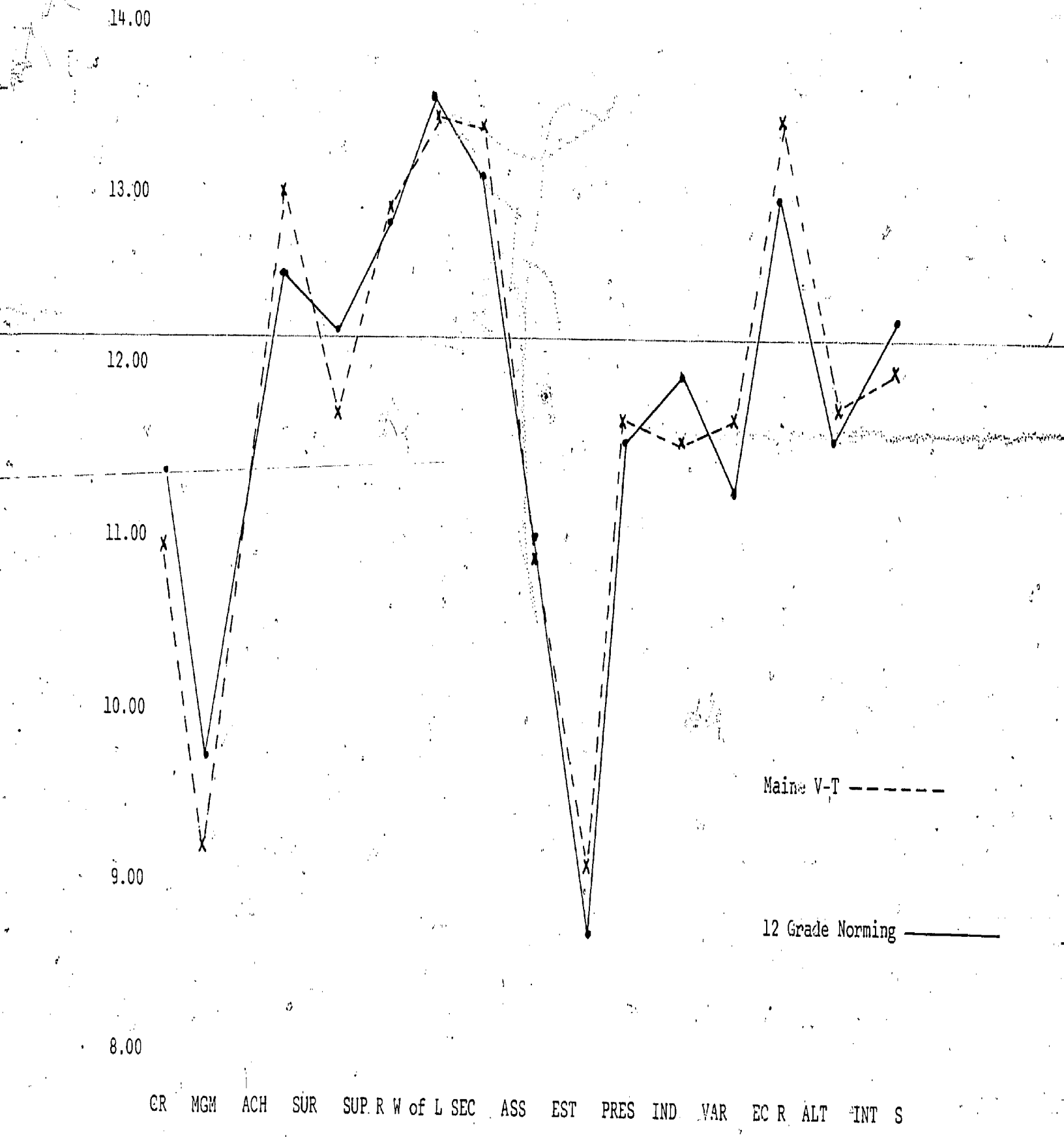

TABLE 15

Means and Standard Deviations of Super's Work Value Inventory by Program of Enrollment Scale

Program N	Creativity	Management	Achievement	Surroundings	Supervisory Relations
1. AUTO (78)	11.282	8.950	12.987	11.512	12.468
MECHANICS	2.352	2.261	1.634	2.328	1.986
2. BUILDING (41)	10.951	9.951	13.375	11.293	13.000
TRADES	2.247	2.738	1.462	2.369	1.612
3. ELECTRICITY (69)	11.167	9.353	12.464	11.157	11.957
ELECTRONICS	2.137	2.832	2.026	2.557	2.973
4. FOOD (6)	11.167	11.000	11.667	12.000	12.667
SERVICES	2.137	2.366	3.386	4.147	3.502
5. DISTRIBUTIVE (23)	11.043	9.182	13.826	12.043	12.565
EDUCATION	2.345	2.281	1.114	2.033	2.107
6. DRAFTING (15)	10.333	9.375	13.125	11.938	12.600
	2.690	2.604	1.455	1.843	1.993
8. MACHINE (39)	10.795	9.447	12.692	11.103	12.462
SHOP	2.364	2.250	1.490	2.479	1.553
9. CONSERVATION	11.625	9.250	12.875	12.375	12.875
	1.598	2.659	1.356	1.923	1.808
10. GRAPHIC (15)	11.667	8.467	13.667	11.867	13.333
ARTS	1.893	1.598	1.496	1.598	1.447
11. GENERAL (18)	10.444	8.333	13.056	11.722	12.833
TRADES	1.723	2.065	1.765	2.608	1.790
12. HEATING (21)	9.905	9.000	13.190	11.143	12.762
AIRCONDITIONING	3.032	3.130	1.806	2.651	1.729
TOTAL (333)	10.925	9.267	12.976	11.454	12.530
	2.461	2.505	1.731	2.391	2.144
STANDARDIZATION	11.30	9.96	12.47	11.88	12.50
SAMPLE	2.51	2.36	2.11	2.17	2.13

TABLE 15 (Continued)

Means and Standard Deviations of Super's Work Value Inventory by Program of Enrollment Scale

	Way of Life	Security	Associates	Esthetics	Prestige	Independence	Variety	Economic Return
1.	13.038	12.962	10.759	8.175	11.688	11.329	11.300	12.962
	1.951	1.958	1.969	2.832	2.066	2.341	2.426	1.761
2.	13.220	13.683	11.073	10.585	11.463	11.171	11.683	13.707
	1.969	1.540	2.017	2.366	2.388	2.810	2.413	1.662
3.	13.643	12.853	10.514	9.536	11.414	11.826	12.386	13.814
	3.799	2.445	2.663	2.081	2.753	2.155	9.832	3.743
4.	12.667	12.667	12.167	11.000	11.667	11.667	11.500	11.333
	3.830	3.386	2.787	2.757	2.944	2.875	3.271	4.803
5.	13.261	13.348	11.391	8.652	11.522	11.000	11.000	13.565
	1.514	2.058	1.616	2.248	1.675	1.859	2.236	1.308
6.	13.875	13.375	11.000	8.750	11.688	11.125	10.313	13.250
	1.258	1.628	1.549	3.435	1.303	1.784	2.330	1.438
8.	12.658	12.897	10.410	8.487	11.333	11.103	10.256	13.487
	1.529	1.667	1.728	2.372	2.144	1.917	2.593	1.430
9.	13.125	13.750	9.750	10.500	11.500	12.875	11.750	13.875
	1.642	2.053	1.909	2.204	1.604	1.458	2.121	2.031
10.	13.600	13.133	10.800	9.200	11.714	10.267	11.000	13.200
	1.298	2.532	2.274	2.111	2.016	1.907	2.803	1.859
11.	13.444	12.778	11.667	9.722	11.389	10.611	10.444	13.278
	1.653	2.315	1.815	2.270	2.173	2.062	1.653	1.602
12.	13.905	13.524	10.571	8.905	11.095	12.048	11.810	13.524
	1.513	2.294	2.336	3.081	2.827	1.962	2.581	1.965
OTAL	13.296	13.144	10.801	9.125	11.494	11.355	11.371	13.401
	2.362	2.079	2.131	4.768	2.252	2.229	4.988	2.342
	13.35	12.68	10.84	8.51	11.38	11.73	10.87	12.97
	1.93	2.54	2.17	2.74	2.27	2.19	2.46	2.19

TABLE 15 (Continued)

Means and Standard Deviations of Super's Work Value Inventory by Program of Enrollment Scale

	Altruism	Intellectual Stimulation
1.	11.734	11.564
	2.437	1.863
2.	11.707	11.463
	2.159	1.859
3.	10.657	11.203
	2.869	2.392
4.	11.667	9.667
	1.966	2.806
5.	12.739	11.304
	2.320	1.917
6.	12.250	10.875
	1.915	2.094
8.	11.103	11.359
	1.984	1.581
9.	11.625	11.250
	2.264	2.252
10.	11.667	11.133
	2.160	1.598
11.	11.944	11.056
	1.434	2.043
12.	12.381	11.952
	2.156	2.397
TOTAL	11.571	11.338
	2.390	2.027
	11.37	11.80
	2.60	2.10

TABLE 16

Comparison of Rank Order of Values on the WVI for Maine Voc-Tech Sample and Norming Sample of 12th Grade Boys

Scale	Group Voc-Tech	Norming Sample
Economic Returns	1	2
Way of Life	2	1
Security	3	3
Achievement	4	5
Supervisory Relations	5	4
Altruism	6	10
Prestige	7	9
Surroundings	8	6
Variety	9	12
Independence	10	8
Intellectual Stimulation	11	7
Creativity	12	11
Associates	13	13
Management	14	14
Esthetics	15	15

same for both groups. Intellectual Stimulation had a rank of seven for the norming sample but was in eleventh position for the Maine sample.

The mean for Economic Returns was higher for the 1974 sample than for the 1970 group reported by the supervisors. The difference might partially be accounted for by the economic conditions in the country today and partially by the make-up of the two samples. The Maine sample included only vocational technical students.

Way of Life was second highest; it relates to developmental needs of students of this age group for independence and autonomy. Security had a slightly higher mean score than found in the norming sample. The importance of this factor to Maine students can be understood because there is a higher unemployment rate in some sections of the state than the national average as well as a scarcity of jobs at the entry level for adolescents.

The scores on the Altruism scale were slightly lower for Maine students than reported in the norms. With Watergate and other related happenings in the world today, students may tend to be less altruistic.

Esthetics and Creativity were ranked low by both groups. Both represent intrinsic rewards. Furthermore, the curriculum in high schools as well as in vocational technical high schools tends not to include experiences in the esthetics domain or to encourage creative activities.

For the Auto Mechanics group of 78 students the highest mean score was on the Way of Life scale. The Achievement scale was second, Security and Economic Returns were tied for third, and Supervisory Relations was fifth. Esthetics and Management were the two low scales.

For the Building Trades group of 41 students, Economic Returns had the highest mean score, followed by Security. Achievement was third, with Way of Life fourth and Supervisory Relations fifth. Management was the lowest scale.

Esthetics was next lowest, but was over two points higher than the mean for the Auto Mechanic group.

For the Electronic group of 69 students, Economic Returns was the scale with the highest mean score, followed by Way of Life. Security was third, Achievement fourth, and Variety fifth. Again Management and Esthetics were lowest, followed by Associates and Altruism.

For the Distributive Education group of 23 students Achievement was first, followed secondly by Economic Returns and Way of Life. Altruism was fourth and Supervisory Relations fifth. Esthetics and Management were the two lowest scales.

For the Machine Shop group of 39 students Economic Returns was the highest scale, followed by Security and then Way of Life. Achievement and Supervisory Relations were next in order. Esthetics, Management, and Associates were the three lowest values.

For the General Trades group of 18 students Way of Life was the highest scale, followed in turn by Economic Returns, Achievement, Supervisory Relations, and Security. Management was the lowest, followed by Esthetics and Independence.

For the Heating/Air Conditioning group of 21 students Way of Life was the highest scale, followed by Security, Economic Returns, Achievement, and Supervisory Relations. Esthetics, Creativity, and Management were the three lowest scales.

The tangible values, such as Economic Returns and Security, appear, as expected, to be high values for those preparing for skilled and semi-skilled trades. The individuals tested are also concerned about the work environment, especially the relationships with supervisors. Life style variables such as Way of Life are high. Creativity and Intellectual Stimulation are not as important values to students within these trade programs. Achievement motive appears to be high, with the students in these programs indicating a strong work ethic. For programs involving working with people, such as Distributive

Education, intrinsic values are viewed more positively. Esthetics and Management appear to be the lowest scales for about every group. The lack of esthetic values might relate partly to the lack of esthetic programs in most of the school systems in Maine and might partly be due to the realistic job choices of the students involved in the vocational technical programs.

An analysis of variance was computed on the WVI scales by program of enrollment. Table 17 contains a summary of the F values found. There were significant differences found on three of the fifteen scales. An F of 3.8522 was computed on the Surroundings scale and with 10/325 degrees of freedom was significant at the .01 level. The Conservation and Distributive Education groups had the highest mean scores while the Trade group, Heating/Air Conditioning, Machine Shop, and Electricity/Electronics had the lowest means. Surroundings is a value associated with "work which is carried out under pleasant conditions--not too hot or too cold, noisey, dirty, etc." Job areas where surroundings might be a critical factor tended to have higher mean scores. Trades where workers would have to work under all kinds of environmental conditions had lower mean scores.

An F of 2.1847 was computed on the Achievement scale and with 10/325 degrees of freedom was significant at the .05 level. There were differences between the means of the group. The Distributive Education group had the highest mean, followed by those in Graphic Arts. The Food Services group had the lowest mean; Electricity/Electronics the second lowest. Differences may be accounted for by the product orientation of the programs.

An F of 2.2733 was significant at the .05 level with 10/325 degrees of freedom for the Altruism scale. The Distributive Education group had the highest mean (12.739); the Electricity/Electronics group had the lowest (10.657). The orientation of the workers in these areas is different.

TABLE 17

Summary Table or Analysis of Variance of the Work Value Inventory by Program of Enrollment

Scale	F
Creativity	0.9093
Management	0.9850
Achievement	2.1847*
Surroundings	3.8522**
Supervisory Relations	0.9975
Way of Life	0.8375
Security	0.7791
Associates	1.291
Esthetics	1.0497
Prestige	0.1812
Independence	1.6387
Variety	0.6720
Economic Returns	1.1180
Altruism	2.2733*
Intellectual Stimulation	0.8770
	df=10/325

* Sig at .05 level
**Sig at .01 level

Distributive Education involves work with people, whereas individuals in Electricity work more with things.

Another question asked was whether the students' certainty of job choice made any difference in their value structure on the WVI. There were significant differences on the mean scores on the WVI on two scales when students were compared by their certainty of job choice. The means and standard deviations as well as the results from the analysis of variance by certainty of job choice are presented in Table 18.

An F of 9.3386 with 2/302 degrees of freedom was found on the Intellectual Stimulation scale and was significant at the .01 level. The more certain the students' job choice, the higher the mean score on the scale. The group who was "very certain" had the highest mean (11.818), followed by those "fairly certain" (11.029). Those "uncertain" had the lowest mean (9.3386).

A significant difference between the means at the .05 level was found on the Variety scale. The "very certain" group had the highest mean (11.494), followed by the "fairly certain" group (10.765); the "uncertain" group had the lowest mean (10.975). Students who are sure of their job choice probably are happy with their program of studies, feeling that their experiences are valuable and that their work provides for independent thinking and for learning how and why things work. The Variety scale reflects a pleasure rather than a task orientation. It is correlated highly with Intellectual Stimulation on the WVI. Students who know their career choice probably enjoy what they are doing and like to do different types of work.

In general the "very certain" group had the highest mean scores on the other scales, although this was not statistically significant except in Surroundings.

A third question asked was whether students having different feelings about school had the same values on the WVI. The means and standard deviations

on the WVI by feelings toward school as well as the resulting F from the analysis of variance are listed in Table 19. There were significant differences between the means of the groups on seven of the fifteen scales. Five of the F values were significant at the .01 level, two at the .05.

The F computed for the Intellectual Stimulation scale was the highest (8.3603) and with 4/329 degrees of freedom was significant beyond the .01 level. The group who liked school very much had the highest mean (12.276), while the group who disliked school had the lowest mean (9.737).

There were also differences on the Altruism scale. An F of 7.9873 was calculated and was significant at the .01 level. The more positive the students' attitude toward school, the higher the mean score (12.750, 12.114, 11.534, 10.158, 10.037).

The same pattern also held for Achievement, with an F of 6.2391, and Creativity, with an F of 5.7266. There were significant differences at the .01 level also on the Esthetics scale and at the .05 level on the Management and Prestige scales.

The pattern of a more positive feeling toward school resulting in a higher mean score on the scale did not hold true for certain scales in which there were not significant F ratios such as on Economic Returns, Associates, and Supervisory Relations. The groups with negative attitudes toward school had means which fell in the same range and sometimes were higher, although not statistically so.

The scales on which there were significant differences measured primarily intrinsic values. In general, the more positive students were toward school, the higher their intrinsic values. Achievement, Intellectual Stimulation, Creativity, Esthetics, and Altruism are all values that are stressed in society and schools. Usually there is a relationship between achievement and attitude

TABLE 18

Analysis of Variance and Means and Standard Deviations of Super's Work Value Inventory by Certainty of Job Choice

Scale		(167) Very Certain	(100) Fairly Certain	(40) Uncertain	F
Creativity	M	11.234	10.485	10.872	2.9831
	SD	2.354	2.614	2.319	
Management	M	9.467	9.130	9.250	.5883
	SD	2.562	2.325	2.706	
Achievement	M	13.169	12.899	12.475	2.8181
	SD	1.579	1.699	2.276	
Surroundings	M	11.494	11.147	11.625	.8507
	SD	2.400	2.414	2.589	
Supervisory Relations	M	12.810	12.450	12.154	2.1673
	SD	1.920	2.037	2.242	
Way of Life	M	13.251	13.218	12.950	.4462
	SD	1.875	1.598	2.148	
Security	M	13.126	13.198	12.538	1.5938
	SD	1.955	1.908	2.614	
Associates	M	10.838	10.618	10.725	.3606
	SD	1.864	2.312	2.298	
Esthetics	M	9.095	8.604	8.675	1.1909
	SD	2.801	2.388	2.886	
Prestige	M	11.605	11.255	11.275	.9039
	SD	2.346	2.071	2.230	
Independence	M	11.437	11.539	10.850	1.4369
	SD	2.172	2.086	2.779	
Variety	M	11.494	10.765	10.975	3.0393*
	SD	2.435	2.462	2.304	
Economic Returns	M	13.423	13.216	13.050	.8708
	SD	1.833	1.755	1.894	
Altruism	M	11.720	11.520	11.026	1.3883
	SD	2.253	2.473	2.590	
Intellectual Stimulation	M	11.818	11.029	10.529	9.3386**
	SD	2.016	1.947	1.935	

* Sig at .05 level
**Sig at .01 level

TABLE 19

Analysis of Variance, Means and Standard Deviation of Super's Work Value Inventory by Feeling About School

Scale		Like School Very Much N = 29	Like School N = 69	It's OK N = 191	Dislike School N = 18	Dislike School Very Much N = 27	F
Creativity	M	12.241	11.348	10.853	9.444	9.889	5.7266**
	SD	1.994	2.261	2.413	2.529	2.926	
Management	M	9.621	9.754	9.316	8.947	7.889	3.0936*
	SD	2.651	2.379	2.338	2.838	2.708	
Achievement	M	13.862	13.174	12.995	11.944	12.000	6.2391**
	SD	1.552	1.339	1.631	2.363	2.304	
Surroundings	M	11.966	11.471	11.823	11.105	10.667	1.2081
	SD	2.044	2.541	2.220	3.381	2.675	
Supervisory Relations	M	12.310	12.657	12.597	12.333	12.481	.2249
	SD	2.551	1.735	1.936	2.401	2.792	
Way of Life	M	13.414	13.275	13.286	13.000	12.481	1.3671
	SD	1.900	1.626	1.610	2.472	2.709	
Security	M	13.552	13.414	13.063	12.421	12.519	1.88[illegible]
	SD	1.660	1.877	2.062	2.364	2.242	
Associates	M	10.690	11.029	10.896	9.789	10.185	2.0746
	SD	2.156	1.880	1.968	2.820	2.450	
Esthetics	M	10.172	9.400	8.782	8.053	7.846	3.8920**
	SD	3.129	2.921	2.567	1.840	2.428	
Prestige	M	12.034	11.714	11.536	10.632	10.333	3.3223*
	SD	2.079	2.214	1.900	2.929	3.150	
Independence	M	11.690	11.414	11.234	12.315	11.037	1.3484
	SD	2.140	1.892	2.214	1.887	3.156	
Variety	M	11.828	11.471	11.052	11.000	10.148	2.1213
	SD	2.508	2.211	2.397	2.357	3.022	
Economic Returns	M	13.448	13.243	13.399	12.842	13.148	0.5628
	SD	1.744	1.715	1.585	3.202	2.107	
Altruism	M	12.750	12.114	11.534	10.158	10.037	7.9873**
	SD	1.777	1.938	2.175	3.023	3.156	
Intellectual Stimulation	M	12.276	11.957	11.257	9.737	10.385	8.3602**
	SD	2.051	1.805	1.795	1.968	2.954	

toward school. One other explanation for the results might be that students who like school are better students academically. The Management scale also showed statistical significance. Management is associated with "work which permits one to plan and lay out work for others to do." In trades and technical fields work has to be specified by others.

Ohio Vocational Interest Survey (OVIS)

A pictorial description of the OVIS scales of the three largest programs is presented in Figure 2. The three programs compared are Auto Mechanics (N=40), Building Trades (N=44), and Electricity/Electronics (N=38). The means and standard deviations on the OVIS by program are listed in Table 20.

Similarities among the three programs can be noted. All three groups peak on the Machine Work, Crafts, and Training scales. Lows can be seen on the Personal Service, Clerical Work, Nursing, and Medical scales.

The Electricity/Electronics group tended to have greater intensity of interest on most of the scales. The technical nature and specificity of the job may account for some of the differences. The Electronics group was highest on the Crafts scale, next highest on the Applied Technology scale, and third on the Technology scale. Their lowest scores were on the Medical, Clerical Work, Literary, and Manual Work scales.

The Building Trades group was highest on the Machine Work scale and next highest on the Agriculture scale. Crafts and Training were next in order. They were lowest on the Clerical Work, Skilled Personal Services, Literary, and Medical scales.

The Auto Mechanics group was highest on the Machine Work scale and second highest on the Crafts scale. They were lowest on the Clerical Work, Nursing, Literary, and Personal Services scales.

Although there were only eleven students in the sample from Distributive Education, their profile was more socially oriented and their highest score was

Figure 2: OVIS Scale Profiles for Students in Auto Mechanics, Building Trades, Electricity/Electronics

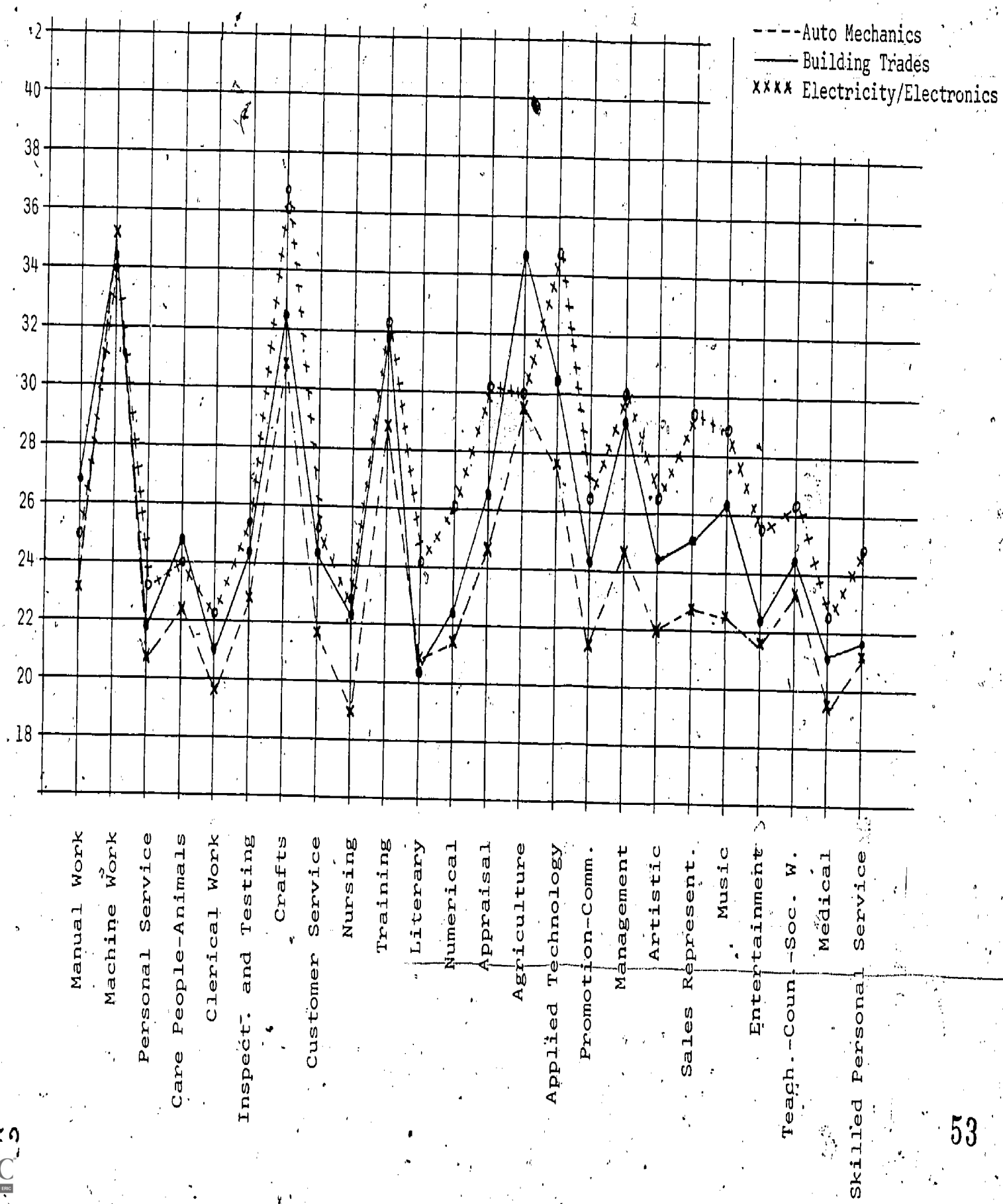

TABLE 20

Results of the Analysis of Variance, Means and Standard Deviations on the OVIS by Program of Studies

Program	N		Manual Work 1	Machine Work 2	Personal Services 3	Care Peop An 4	Clerical Work 5	Inspect-Test 6	Crafts 7	Customer Serv 8	Nursing 9
1. Auto Mechanics	40	M	23.675	34.825	20.690	22.150	19.930	22.650	31.025	21.925	19.150
		SD	8.291	8.981	8.406	8.851	8.256	9.108	9.330	10.024	8.402
2. Building Trades	44	M	26.432	34.455	21.841	25.295	21.023	24.250	32.477	24.114	22.023
		SD	7.837	9.975	7.461	7.681	7.741	7.821	8.429	8.130	7.167
3. Electricity Electronics	38	M	24.711	34.139	23.077	24.000	22.100	25.436	36.692	25.378	22.308
		SD	7.458	8.764	8.308	7.248	7.239	7.074	6.764	7.700	7.053
4. Food Services	7	M	26.857	25.286	33.286	34.429	32.714	30.143	26.714	34.714	28.571
		SD	6.256	6.849	6.211	7.390	12.672	4.634	5.187	10.719	3.994
5. Distributive Education	11	M	25.273	24.091	33.182	38.000	29.818	27.000	26.273	36.091	31.727
		SD	8.557	8.443	7.209	9.970	7.897	2.898	8.403	7.635	9.809
6. Drafting	13	M	24.077	32.846	23.462	25.846	23.000	26.923	34.231	26.846	21.615
		SD	6.551	5.886	4.960	7.936	4.882	5.590	7.085	6.568	5.378
7. Data Processing	8	M	22.625	21.625	32.250	36.750	31.625	29.375	23.750	40.500	28.500
		SD	3.889	8.314	8.013	8.940	9.410	5.902	8.812	7.521	9.055
8. Machine Shop	6	M	25.167	36.833	21.833	26.667	18.000	27.333	33.333	23.833	22.333
		SD	2.483	5.307	5.947	7.992	5.367	6.470	4.803	6.795	7.033
9. Conservation	8	M	24.875	31.250	22.250	21.750	21.375	24.875	28.375	26.000	18.750
		SD	7.473	7.833	8.137	9.910	7.405	8.790	9.023	9.442	8.259
TOTAL	175	M	24.909	33.012	23.596	25.909	22.522	25.119	32.040	26.098	22.426
		SD	7.440	9.749	8.521	9.315	8.526	7.583	8.644	9.659	8.149
F 8/166			0.5386	6.1463**	5.8882**	7.2729**	5.1011**	1.5939	4.1953**	7.2651**	4.5107**

TABLE 20 (Continued)

Results of the Analysis of Variance, Means and Standard Deviations on the OVIS by Program of Studies

Skilled Per-Serv. 10	Training 11	Literary 12	Numerical 13	Appraisal 14	Agriculture 15	Applied Tech. 16	Promot Comm 17	Management 18	Artistic 19
21.650	28.525	20.475	21.725	24.450	29.700	27.500	21.200	24.600	22.000
8.110	9.753	10.072	11.045	10.084	11.161	10.924	9.680	9.562	10.288
21.727	32.045	21.409	22.205	26.864	34.364	31.364	24.136	29.295	24.682
7.463	6.871	8.384	7.796	8.555	9.107	8.777	7.970	8.998	7.405
24.641	32.026	24.077	26.000	30.154	30.308	34.974	26.615	30.000	26.282
6.903	7.831	7.717	8.792	7.162	7.675	8.315	8.226	8.587	7.097
38.714	38.429	33.143	22.143	30.000	33.000	26.000	30.857	33.571	34.857
6.370	4.467	8.375	8.934	9.434	12.207	7.371	7.647	10.390	10.885
32.364	35.273	32.182	28.364	28.636	31.636	29.727	32.273	33.636	35.091
9.124	5.798	10.048	9.091	9.698	10.604	11.367	9.603	8.675	9.596
26.077	33.538	27.615	28.308	33.462	32.308	40.308	29.692	31.308	34.385
6.317	5.868	6.500	6.303	7.666	9.707	7.476	7.341	5.360	9.161
32.250	34.000	24.250	30.375	24.500	25.000	24.125	29.875	32.625	34.000
6.018	9.024	7.869	10.649	9.681	10.433	8.526	11.801	9.023	7.521
23.000	34.000	20.667	21.500	27.667	35.833	31.167	22.833	25.667	24.167
8.438	3.225	7.367	7.791	7.840	5.981	9.304	8.954	10.482	6.911
22.125	28.125	21.625	20.375	25.250	35.250	23.750	22.250	26.250	24.750
7.990	9.775	10.141	11.326	10.264	10.082	10.181	10.593	8.908	10.525
24.557	31.783	23.500	24.023	27.614	31.693	30.949	25.335	28.857	26.608
8.523	8.044	9.245	9.424	9.020	9.737	10.079	9.294	9.189	9.568
7.4080**	2.2220*	3.8961**	2.1382*	2.0887*	1.5213	4.6335**	3.3295**	2.3544*	5.9890**

TABLE 20 (Continued)

Results of the Analysis of Variance, Means and Standard Deviations on the OVIS by Program of Studies

Sales Rep 20	Music 21	Entertainment 22	Teach Coun 23	Medical 24
22.850	22.581	21.949	23.850	19.450
9.752	11.362	9.536	9.994	9.204
25.698	26.386	22.250	25.159	21.182
8.096	11.292	7.637	7.594	7.202
29.872	29.150	25.658	26.132	22.564
7.971	11.016	7.947	7.215	8.016
30.143	32.714	30.000	32.000	22.571
9.008	7.477	6.708	6.272	6.241
28.455	34.000	32.636	29.909	28.364
6.563	12.313	10.366	7.968	10.548
29.308	33.769	30.231	28.000	23.692
6.033	11.144	9.075	6.758	6.713
29.375	26.625	27.500	33.500	23.875
11.096	11.673	9.487	12.398	8.935
22.500	24.833	25.500	22.333	22.667
5.320	11.232	9.182	5.715	9.352
25.375	21.250	20.000	21.875	18.375
9.334	8.746	8.194	10.829	9.102
26.640		24.741	25.989	21.830
8.728	27.067	9.085	8.689	8.403
2.4706*	11.530	3.6047**	2.3877*	1.6748

on the Caring for People scale, which relates to work concerning the day-to-day needs of people. Their second highest score was on the Training scale; third highest was the Artistic scale, fourth was Music, and fifth was Personal Services.

The number of students enrolled in the other programs was less than fifteen. The standard error of the mean would be large and therefore a profile analysis would be of limited value. However, the sample was used to compare the OVIS by program of enrollment for purposes of the comparison of scale by analysis of variance, since trends among groups were to be studied rather than individual profiles of groups.

Three research questions were asked about the scores of the vocational technical high school students on the OVIS. The first question asked was whether there was a difference in the interest of students on the OVIS when compared by program of studies. The results from the analysis of variance, the means and standard deviation on the OVIS by program of study are presented in Table 20.

There were significant differences between the means of the groups on twenty of the twenty-four scales. Only on four scales--Manual Work, Inspection-Testing, Agriculture, and Medical--were there no significant differences between the means of the groups. Fourteen of the twenty comparisons were significant at or beyond the .01 level, while two were significant at the .05 level.

An F of 7.408 was computed on the Skilled Personal Services scale and was significant at the .01 level. The Food Services group had the highest mean (38.714), followed by the Distributive Education group (32.364), while the Auto Mechanics had the lowest mean (21.650) and Building Trades the next lowest (21.727).

An F of 7.2651 was computed on the Customer Services scale and was significant at the .01 level. The Data Processing, Distributive Education, and Food Services groups had the highest means; the Auto Mechanics and Building Trades groups the lowest.

An F of 6.1463 was computed on the Machine Work scale and was significant at the .01 level. The Auto Mechanics, Building Trades, and Electricity groups had the highest means, whereas the Data Processing, Distributive Education, and Drafting groups had the lowest means.

An F of 5.8882 was computed on the Personal Services scale and was significant at the .01 level. The Food Services, Distributive Education, and Data Processing students had the highest means, while the Auto Mechanics, Building Trades, and Machine Shop students had the lowest.

An F of 5.1011 was computed on the Clerical Work scale and was significant at the .01 level. The Food Services, Data Processing, and Distributive Education groups had the highest means and the Machine Shop and Auto Mechanics students had the lowest.

An F of 5.9890 was found on the Artistic scale and was significant at the .01 level. The Distributive Education, Drafting, and Food Services groups had the highest means; the Auto Mechanics had the lowest mean.

An F of 4.5107 was calculated for the Nursing scale and was significant at the .01 level. The Distributive Education, Food Services, and Drafting groups had the highest means, while the Auto Mechanics and Building Trades groups had the lowest.

An F of 4.6335 was found on the Applied Technology scale and was significant at the .01 level. The Drafting, Electricity, Machine Shop, and Building Trades groups scored highest, with the Conservation and Data Processing groups scoring the lowest.

An F of 4.1953 was computed on the Crafts scale and was significant at the .01 level. Electronics, Drafting, and Machine Shop had the highest means and Data Processing and Food Services had the lowest.

An F of 7.2729 was computed on the Caring for People or Animals scale and was significant at the .01 level. The Distributive Education, Data Processing, and Food Services groups were the three highest, while the Conservation and Auto Mechanics groups had the lowest mean scores.

An F of 3.8961 was found on the Literary scale and was significant at the .01 level. The Food Services and Distributive Education groups ranked first and second; Auto Mechanics and Machine Shop were at the bottom of the list.

An F of 3.3295 was calculated for the Promotion-Commercial scale. Distributive Education was highest, followed next by Food Services. The Auto Mechanics and Conservation groups were lowest.

The means of the Entertainment scale were also significantly different at the .01 level. Distributive Education, Drafting, and Food Services were highest; Conservation and Auto Mechanics were lowest.

The means in the Music scale, too, were significantly different at the .01 level. Distributive Education, Drafting, and Food Services were highest, while Conservation and Auto Mechanics were lowest.

There were six scales with significant F values at the .05 level. On the Numerical scale the Data Processing group scored highest, followed by the Distributive Education and Drafting students. Conservation and Auto Mechanics students scored lowest. On the Appraisal scale, Drafting and Electricity groups were highest, while the Auto Mechanics and Data Processing groups were lowest. On the Management scale, the Distributive Education, Data Processing, and Food Services groups were highest. The Auto Mechanics and Machine Shop groups were lowest. On the Teacher-Counselor scale, the Data Processing and

Food Services groups had the highest means, with the Conservation and Auto Mechanics students scoring lowest. On the Training scale the Food Services and Distributive Education groups were highest and the Conservation and Auto Mechanics students were lowest.

Differences can be seen on the scale by orientation of the job. The students enrolled in people-oriented programs tended to score higher on the social types of scales where work is related to people rather than things. Students in Distributive Education, Food Services, etc. scored higher on such scales as Personal Services, Customer Services, Skilled Personal Services, etc. Students who are enrolled in programs that are thing-oriented or machine- or trade-centered scored higher on scales such as Machine Work, Agriculture, Crafts, etc.

A second question asked was whether certainty of job choice made any difference in the mean scores of students on the OVIS. The results of the analysis of variance, the means and standard deviations on the OVIS by certainty of job choice are presented in Table 21. No significant differences were found or any consistent patterns identified.

A third question asked was whether attitude toward school made any difference in the mean scores of students on the OVIS. There were significant differences between the means at the .05 level on six of the OVIS scales. The results of the analysis of variance, the means and standard deviations on the OVIS by attitude toward school are presented in Table 22. These were the Numerical, Appraisal, Applied Technical, Promotion-Commercial, Management, and Sales Representative scales. On the Numerical and Promotion-Commercial scales the "like school very much" group had the highest means, followed in order by the "like school" and "it's OK" groups. There is no consistent pattern, since on the Appraisal, Promotion-Commercial, Management, and Sales Representative scales the "dislike school very much" group had higher mean scores than did the "dislike school" group

TABLE 21

Results of the Analysis of Variance Means
& Standard Deviations on the OVIS by Certainty of Job Choice

OVIS			Manual Work	Machine Work	Personal Services	Care Peop An	Clerical Work	Inspect test	Crafts	Customer Service
Certainty of Choice	N									
Very Certain	M	95	24.505	33.653	22.823	25.568	21.979	24.537	32.242	25.537
	SD		7.232	9.632	8.191	9.202	8.195	7.543	8.995	9.412
Fairly Certain	M	38	25.500	32.865	24.825	26.658	22.976	27.000	32.526	27.622
	SD		8.100	9.618	8.617	9.133	8.058	7.641	8.285	9.756
Uncertain	M	21	25.667	32.857	23.909	26.476	22.435	25.773	32.545	25.857
	SD		7.592	10.678	9.456	10.524	8.686	8.223	8.814	9.764
F 2/151 F 2/152			0.3634	0.1183	0.8202	0.2208	0.2152	1.4489	0.0210	0.6429

TABLE 21 (Continued)

Nursing	Skilled Pers-Serv.	Training	Literary	Numerical	Appraisal	Agriculture	Applied Tech.	Promot Amm
22.158	23.789	32.095	22.663	23.832	27.874	31.211	31.621	25.021
8.289	8.163	8.209	9.173	9.028	9.056	9.925	9.697	9.522
22.895	25.868	30.974	24.026	24.865	27.868	32.500	30.368	25.868
8.050	8.954	8.274	9.520	10.242	8.783	10.638	9.920	9.413
21.909	25.591	32.762	25.682	23.182	27.318	33.455	30.955	25.227
7.855	9.080	8.432	9.848	9.430	8.850	9.560	11.737	8.524
0.1406	1.0052	0.3804	1.0345	0.2566	0.0370	0.5520	0.2201	0.1120

TABLE 21 (Continued)

Management	Artistic	Sales Rep	Music	Entertainment	Teach Coun	Medical
28.989	25.926	26.575	27.000	23.968	25.484	21.653
9.064	9.640	8.773	12.119	8.842	9.001	8.425
29.158	27.947	27.789	28.415	26.784	27.026	22.658
9.304	9.620	8.393	11.485	9.443	8.719	9.298
28.810	27.955	25.955	26.565	24.143	25.762	20.636
9.309	9.469	8.220	10.317	9.270	8.899	6.856
0.0109	0.8155	0.3902	0.2626	1.3313	0.4096	0.4169

TABLE 22

Results of the Analysis of Variance, Means and Standard Deviations by Feelings About School

OVIS Feeling About School	N	Manual Work	Machine Work	Personal Services	Care Peop-An	Clerical Work	Inspect Test	Crafts
Like school very much	15	23.867	29.143	25.667	29.600	26.533	26.400	31.333
		6.140	11.883	10.560	10.702	10.013	8.542	10.614
Like School	45	27.044	34.644	25.044	27.533	23.689	27.044	34.111
		7.404	8.671	6.564	8.774	5.935	6.389	7.046
It's OK	92	24.370	32.945	22.660	24.913	21.677	24.344	31.849
		7.344	9.629	8.908	9.353	9.226	7.978	8.350
Dislike school	12	23.500	30.333	22.692	24.833	21.769	23.917	28.667
		5.745	12.851	8.087	8.430	9.194	6.585	10.748
Dislike school very much	11	23.636	34.727	23.583	23.727	20.833	23.364	29.818
		10.642	7.708	9.491	9.403	7.043	7.839	11.107
F 4/170		1.3192	1.1847	0.8686	1.3975	1.4416	1.3076	1.3312

TABLE 22 (Continued)

Customer Service	Nursing	Skilled Pers. Serv.	Training	Literary	Numerical	Appraisal	Agriculture	Applied Tech.
30.667	25.133	26.533	33.067	23.733	28.000	28.667	28.933	33.000
11.944	9.970	8.114	7.685	9.161	10.156	10.328	7.497	10.474
28.489	24.267	25.289	32.956	26.089	26.778	31.311	33.111	34.111
7.162	7.750	7.421	6.245	8.597	7.903	7.403	8.310	8.899
24.714	21.634	24.398	30.989	22.645	22.891	26.086	31.796	29.452
10.199	8.210	9.115	8.391	9.572	9.883	9.205	10.123	10.121
23.667	20.083	22.667	34.000	21.667	18.417	23.667	31.583	26.750
7.785	4.814	9.316	9.658	9.089	6.598	8.521	10.850	10.046
24.182	20.455	22.273	29.455	21.818	22.909	28.273	28.909	32.455
10.008	8.371	7.630	10.093	8.658	8.972	8.356	13.240	11.255
2.3661	1.6401	0.6329	1.0175	1.3013	3.2177*	3.3711*	0.7638	2.4355*

TABLE 22 (Continued)

Promot Amm	Management	Artistic	Sales Rep	Music	Entertainment	Teach Coun.	Medical
28.467	30.867	29.267	29.067	28.333	27.714	30.200	23.467
12.223	11.482	8.276	10.552	9.940	7.995	11.453	9.326
28.133	32.156	29.067	29.705	29.533	27.044	27.844	23.733
8.292	7.407	8.502	6.590	11.257	9.525	7.857	8.150
24.237	27.609	25.301	25.293	26.292	23.946	25.011	20.968
9.156	9.573	10.043	9.026	11.918	9.063	8.527	8.477
21.417	25.167	26.000	23.231	25.154	21.583	22.833	19.500
7.609	6.279	10.600	6.894	13.120	8.898	6.548	6.626
23.182	27.091	24.636	26.364	24.417	21.636	24.273	21.636
8.965	8.757	8.835	10.122	8.490	6.816	9.133	8.857
2.5375*	2.7454*	1.6182	2.8040*	0.9201	2.0035	2.2513	1.2020

and in some cases even the "it's OK" group.

Numerical and Promotion-Commercial scales represent job areas that demand verbal and numerical skills. Students who do well in school would probably tend to do better in these areas and to show greater achievement, therefore feeling positive about school.

Students high on the Appraisal scale like to evaluate. Students who might be less accepting of school could tend to be more critical in their evaluations and like job areas related to evaluation.

Liking or disliking school might not affect a student's interest in a given occupational field, especially a technical one. Therefore, there might be a mixed relationship expected on the Applied Technical scale.

Career Maturity Inventory: Attitude Scale

The Attitude Scale on Crites Career Maturity Inventory (1973) was used to measure students' attitudes toward career choice and entering the world of work. Five separate attitudinal clusters are included in the test but are combined to yield a single attitude score. They include: involvement in the career choice process, orientation toward work, independence in decision making, preference for career choice factors, and conceptions of the career choice process. The higher the score on the 50-item Attitude Scale of the CMI, the more positive the attitude represented.

The first question asked was whether there was a relationship between scores on the Attitude Scale of the CMI and program of enrollment. This information was available from 203 subjects. The CMI means and standard deviations by program of enrollment are presented in Table 23. The Data Processing students had the highest mean (37.8), followed by those in Electricity/Electronics (37.1). Those enrolled in General Trades had the lowest mean (30.2). The combined mean score achieved by the sample eleventh and twelfth grade vocational technical high school

TABLE 23

Means and Standard Deviations on Attitude Scale of the Career Maturity Inventory by Program of Study

Program	N	Means	Standard Deviations
1. Auto Mechanics	30	33.467	6.301
2. Building Trades	30	35.267	4.571
3. Electricity & Electronics	30	37.133	5.380
5. Distributive Education	11	35.818	5.231
6. Drafting	34	35.412	4.793
7. Data Processing	8	37.875	2.850
8. Machine Shop	24	33.375	5.686
10. Graphic Arts	16	33.500	5.177
11. General Trades	20	30.200	5.926
TOTAL	203	34.571	5.589

TABLE 24

Analysis of Variance of the Attitude Scale of Career Maturity Inventory by Program of Study

Source of Variation	Sum of Squares	d.f	Mean Square	F
Between Groups	811.4297	8	101.4287	3.5787**
Within Groups	5498.3828	194	28.3422	
TOTAL	6309.8125	202		

** Sig at .01 level

TABLE 25

Means and Standard Deviations on the Attitude Scale of the Career Maturity Inventory by Certainty of Job Choice

Degree	N	Means	Standard Deviations
Very certain	89	35.551	4.876
Fairly certain	58	34.483	5.542
Uncertain	29	32.793	6.662

TABLE 25A

Analysis of Variance of the Attitude Scale of the Career Maturity Inventory by Certainty of Job Choice

Source of Variation	Sum of Squares	df	Mean Square	F
Between groups	172.3633	2	86.1816	2.9319
Within groups	5085.3242	173	29.3949	
Total	5257.6875	175		

students was 34.5, which would fall in the average range but below the median raw score for Crites standardization group. The score for the Building Trades group was in the below average range. The other means fell in the average range. The results from the analysis of variance of the attitude scores of the CMI by program of enrollment are presented in Table 24. There were significant differences in the mean scores of the Attitude Scale of the CMI by program of enrollment. ($F=3.58$, $df=8/194$, $\alpha \leq .01$) The students in the more technical fields, such as Data Processing and Electronics, had the highest mean scores. Those in less technical or more general fields, such as General Trades and Machine Shop, had the lowest mean score.

A second question asked was whether CMI attitude scores were related to one's certainty about his job choice. The means and standard deviations on the Attitude Scale of the CMI by certainty of job choice are listed in Table 25. Fifty-one per cent reported that they were very certain and had a mean of 35.5. Thirty-two per cent checked that they were fairly certain and had a mean of 34.4. The remaining seventeen per cent of the students were uncertain and their mean was 32.7. An analysis of variance of the Attitude Scale by certainty of job choice did not identify any significant relationship between the two variables. ($F=2.93$, $2/173$, N.S.).

A third question asked was whether feeling toward school made any difference in the scores made by students on the Attitude Scale of the CMI. The means and standard deviations of the Attitude Scale of the CMI by level of feeling toward school are included in Table 26. Both the groups who liked school very much and those who disliked school had approximately the same mean: 35.6. The group having the lowest mean was the students reporting that they disliked school very much: 34. An analysis of variance F-ratio of the Attitude Scale of the CMI by feelings about school was calculated to be .4632--non-significant. Thus no

TAPLE 26

Means and Standard Deviations on Attitude Scale of the Career Maturity Inventory by Feelings About School

Feelings	N	Means	Standard Deviations
Like school very much	16	35.625	6.141
Like school	43	34.953	5.191
It's OK	121	34.215	5.583
Dislike school	14	35.643	4.568
Dislike school very much	9	34.000	8.231

Analysis of Variance of the Attitude Scale on the Career Maturity Inventory by Feelings About School

Source of Variation	Sum of Squares	d f	Mean Square	F
Between Groups	58.5000	4	14.6250	.4632
Within Groups	6251.3125	198	31.5723	
Total	6309.8125	202		

apparant relationship existed for this sample between generalized attitude toward work (CMI) and general attitude toward school.

Ability Measures

Mental ability or scholastic aptitude is an obvious factor to consider when one is attempting to differentiate among students in different programs of study. It was conceived, for example, that since some programs seem more intellectually and academically demanding than others, that one might well expect to find students of higher mental ability in the more demanding programs. Following such reasoning, the authors arranged administration of the Otis-Lennon Mental Ability Test (OLMAT) to a total of 222 students distributed across eight different Voc-Tech programs of study. For the interested reader, the results of this testing are reported in Table 27. Although the mean scores ranged across a ten point span from 33 to 43, one has no way of knowing whether such differences are "real" or attributable to chance and error factors until a statistical test of significance is computed. The results of analysis of variance reported in Table 28 indicate an F ratio of 1.98, which is not significantly large enough to accept the differences among these means as being attributable to anything but chance. What this appears to indicate is that we have no basis for believing that the students in various programs are differentiated on the basis of general mental ability. However, when the more specific aspects of mental ability were considered, some interesting revelations were found. A measure of such abilities is the Analysis of Learning Potential (ALP).

The ALP, which is composed of nine specific subtests of mental ability, was administered to the students in one school. The question was asked whether there were differences in the mean scores on the sub scales of ALP by program of enrollment. The means and standard deviations and F values from the analysis of variance are presented in Table 29. There were significant differences in the

TABLE 27

Results of Otis-Lennon Mental Ability Test (OLMAT)
by Program of Study.

Program	N	MEAN	STD DEV
Auto mech	58	37.052	12.756
Bldg. Trades	33	33.030	12.429
Elec/Election	50	42.140	16.073
Food Service	7	39.000	11.888
Distributive Education	22	39.091	14.040
Machine/Tool	22	43.864	11.805
Conservation	8	41.125	14.476
Htg. & Air Condg.	22	41.273	12.345
TOTAL	222	39.1036	13.3619

TABLE 28

Analysis of Variance:
Otis-Lennon Mental Ability Test (OLMAT)
by Program of Study

	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
BETWEEN GROUPS	2557.3086	(7)	365.3296
WITHIN GROUPS	39457.5664	(214)	184.3811
TOTAL	42014.8750	(221)	

F = 1.9814 N.S.

TABLE 29

Analysis of Variance: Means and Standard Deviations of the Analysis of Learning Potential Test by Program of Study

Program	N	Word Meaning	Numerical Relations	Word Categ.	Spat Reasoning	Num Fluency	Num Op Reasoning	Word Cues	Syntax Cues	Evid Eval
Auto Mechanics	22	12.227	6.217	14.783	7.435	8.955	6.800	8.818	6.190	9.773
		4.889	2.844	4.622	3.501	5.473	3.518	3.418	2.750	3.715
Building Trades	20	12.900	7.600	15.300	6.200	8.050	4.611	10.450	7.550	9.650
		4.051	3.136	5.362	2.628	3.252	2.330	2.625	2.892	2.925
Electricity/ Electronics	20	17.050	8.286	19.333	7.238	10.381	9.143	11.571	9.762	10.619
		4.936	2.831	5.489	3.700	4.068	3.864	4.365	4.182	4.421
Drafting	19	15.368	8.500	19.000	8.200	10.150	8.450	11.850	9.000	12.100
		4.561	3.472	5.161	4.086	3.392	4.442	3.376	4.267	3.851
Machine Shop	18	10.667	7.667	14.222	7.412	7.944	6.333	9.167	5.833	9.333
		4.102	2.326	5.375	2.599	3.489	3.218	2.706	2.149	3.941
Graphic Arts	16	13.563	8.063	14.688	6.875	7.125	5.000	10.813	7.438	9.313
		4.746	2.462	5.016	2.527	3.052	2.898	3.655	3.306	3.361
General Trades	21	9.905	8.857	15.381	6.650	9.190	7.250	10.000	6.100	10.200
		4.194	3.071	5.025	3.376	3.326	3.626	3.026	1.804	3.427
Total	136	13.066	7.856	16.158	7.153	8.906	6.910	10.372	7.441	10.175
		5.003	2.977	5.414	3.278	3.922	3.761	3.464	3.429	3.732
F 6/129		6.1519**	1.9082	3.4355**	0.7595	1.7988	4.2490**	2.3414*	4.5502*	1.3618

*Sig at .05 level
**Sig at .01 level

means of the groups on five of the nine scales compared. Four of these differences were significant at the .01 level. These were the Word Meaning, Word Categories, Number Operations Reasoning, and Syntactic Clues scales. The F value for the Word Clues scale was significant at the .05 level.

On the Word Meaning scale the students enrolled in Electricity/Electronics had the highest mean score (17.05), those in Drafting second (15.37), while students enrolled in General Trades had the lowest (9.91) and those in Machine Shop the next lowest (10.677).

On the Word Category scale, the students in the top two ranks remained the same (Electricity, 19.33; Drafting, 19.00), while students in Graphic Arts had the lowest mean (14.69) and students in Auto Mechanics the next lowest (17.78).

On the Number Operations Reasoning scale the same pattern tended to hold as in the Word Category scale. Electricity had a mean score of 9.14 and Drafting 8.45; Graphic Arts, 5.00; Auto Mechanics, 6.80; Machine Shop, 6.33.

On the Syntactic Clues scale the Electricity and Drafting groups had the highest mean score, while the Machine Shop, Auto Mechanics, and General Trades groups had the lowest mean scores.

On the Word Clues scale Drafting had the highest mean (11.85); Electricity second (11.571), with Auto Mechanics the lowest (8.818).

In summary, students in Electricity/Electronics and Drafting were differentiated from those in other vocational programs by these five scales.

The authors next asked whether student performance on ALP (mental ability) was affected by their certainty of job choice or whether there was a difference in the mean scores of the ALP by certainty of job choice. The results from the analysis of variance and the means and standard deviations on the nine ALP scales by certainty of job choice are presented in Table 30. Only one of the nine scales showed significant differences. An F value of 5.4706 was computed for

TABLE 20

Analysis of Variance: Means and Standard Deviations on the Analysis of Learning Potential by Certainty of Career Choice

		Word Meaning	Numerical Relations	Word Categ	Spat Reasong	Num Fluency	Num Op Reas	Word Cues	Syntax Cues	Evid Eval
Certainty	N									
Very Certain	61	13.754	8.175	16.[illegible]	7.419	9.565	7.667	10.148	7.803	10.951
		5.406	3.195	5[illegible]	3.361	4.084	3.929	3.336	3.915	3.598
Fairly Certain	41	11.659	7.333	15.[illegible]	6.500	8.405	6.476	10.500	6.610	9.952
		4.223	2.476	4.690	2.680	3.343	3.014	3.344	2.783	3.276
Uncertain	19	12.[illegible]7	7.632	15.895	7.056	8.895	6.053	11.000	7.947	7.947
		[illegible]5	2.773	4.864	4.007	4.818	4.288	3.786	3.118	3.566
F 2/118		[illegible].77	0.9383	1.6762	1.0022	1.0880	1.9756	0.4792	1.7294	5.4706**

** Sig. at .01 level.

the Evaluation of Evidence scale and was significant at the .01 level. The "very certain" group had the highest mean (10.95), followed by the "fairly certain" (9.95); the "uncertain" had the lowest mean (7.947).

On all of the other scales the "very certain" group had the highest mean score. The "uncertain" group had a higher mean score than the "fairly certain" group on seven of the nine scales. These differences, however, were not significant.

The importance of a student's attitude toward school, teachers, and the educational process has long been regarded by educators and other adults as being very important. In seeking to further understand the Voc-Tech students in this study, the authors sought information which would help to further clarify and explain the differences between those students with essentially positive attitudes toward school and those with negative attitudes. The rationale was ventured that those students with higher mental abilities would tend to have more positive attitudes toward school than those with lower mental abilities, due to the probability of more success experiences in school. Previous research studies indicate with a moderate degree of consistency that positive attitudes and clear goals are positively related to academic success. Two shortcomings seem to be apparant, however. The first of these relates to the inability of the methodologies to establish causality, and the second centers on the populations studied. To correct the first of these frailties requires, among other remedies, conditions which provide for comprehensive longitudinal study; clearly beyond the scope of this project. The second malady, however, can be improved upon. Most reported studies involved were generated from populations which may have included but were not restricted to students in Voc-Tech training programs. While previously reported studies may have provided support for these relationships for the entire population, one cannot assume generalizability to selected subpopulations, such as students enrolled in

TABLE 31

Results of OLMAT by Attitudes toward School

Feelings About School	N	MEAN	STD DEV
Like very much	20	40.250	13.114
Like	49	38.143	13.337
OK	121	39.595	13.583
Dislike	16	40.625	12.956
Dislike very much	17	34.471	18.094
TOTAL	223	39.0179	13.7055

TABLE 32

Analysis of Variance: OLMAT by Attitudes toward School

	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
BETWEEN GROUPS	501.1992	(4)	125.2998
WITHIN GROUPS	41700.9258	(218)	191.2886
TOTAL	42202.1250	(222)	
F = .6550	n.s.		

various academic curricula, i.e. general studies, Voc-Tech, and college preparatory.

The results seem to bear out part of the authors' rationale, but certainly do not support it in entirety. In Table 31 will be found the mean mental ability scores from the OLMAT computed for each of the five categories of student attitudes toward school. The results of the analysis of variance, reported in Table 32, do not indicate any significant differences among these mean mental ability scores. From inspection of these scores, this result is not surprising, as one sees the lowest mean score for those students with the most negative attitude and finds that the highest mean score was for the group with the second most negative attitude.

The ALP scores, when also compared by attitude toward school, point to essentially the same finding. The analysis of variance results, means and standard deviations of the ALP by attitude toward school are presented in Table 33. For only one out of the nine sub tests were there significant differences in the mean scores. An F of 3.6982 with 4/131 degrees of freedom was significant at the .01 level for the Word Clues scale. The "dislike school" group had the highest mean, while the "dislike school very much" group had the lowest mean, the significance of which remains obscure. For only three of the nine scales did the "like school very much" group have the highest mean score, although not significantly higher.

Hence, it appears that the degree of "liking" and "disliking" which these students feel toward school is not differentiated on the basis of their mental ability. However, the remaining portion of the authors' rationale (that relating grade point average and mental ability) does seem to have been borne out. When the students were once again grouped according to their reported liking for school and a mean grade point average was calculated for each of

TABLE 33

Analysis of Variance, Means and Standard Deviations of the Analysis of Learning Potential Test by Attitude Toward School

Attitude		Word Meaning	Numerical Relations	Word Categ	Spat Reasoning	Numerical Fluency	Num Op Reasoning	Word Cues
Like School Very Much	7 M	14.857	8.250	19.750	9.125	7.571	5.375	9.875
	SD	4.337	2.252	7.025	3.944	2.507	1.847	2.532
Like School	24 M	14.000	8.833	17.250	7.458	9.500	8.818	12.000
	SD	4.492	3.199	5.194	2.734	4.374	4.043	3.375
It's OK	91 M	12.582	7.559	15.419	6.890	9.054	6.689	9.956
	SD	4.733	2.991	5.153	3.195	3.935	3.821	3.505
Dislike School	7 M	14.143	9.429	17.000	8.000	8.571	5.857	13.000
	SD	6.517	2.760	4.933	4.082	3.867	3.436	1.826
Dislike School Very Much	7 M	13.286	6.429	17.286	6.429	6.571	6.500	8.143
	SD	8.731	1.813	6.993	4.353	2.992	1.871	2.410
F 4/131		.7246	1.8479	1.7107	1.1285	1.0060	2.0447	3.6982**

** Sig at .01 level

TABLE 33 (Continued)

Analysis of Variance, Means and Standard Deviations of the Analysis of Learning Potential Test by Attitude Toward School

Attitude	Syntax Cues	Evid Eval
Like School Very Much	7.250	11.000
	2.816	4.957
Like School	8.875	10.125
	3.871	3.814
It's OK	7.056	10.011
	3.309	3.598
Dislike School	7.000	11.000
	1.732	5.164
Dislike School Very Much	8.143	10.714
	4.598	2.812
F 4/131	1.4617	0.2591

** Sig at 01 level

these five groups, a range of nearly seven points was found across the means, as indicated in Table 34. Visual inspection of the data in this table reveals that there is a high to low rank ordering of means which corresponds directly to the high to low rank ordering of liking for school. The analysis of variance in Table 35 shows an F ratio which is significant at the .05 level of confidence. This indicates that only five times out of a hundred would differences of this magnitude occur by chance. Hence, we can place considerable confidence in the finding that for these Voc-Tech students there is an association between liking school and succeeding academically. One should be careful, however, not to infer from this a causal relationship, as we have no means of knowing which came first, liking school or academic success.

The means and standard deviations of academic average by certainty of job choice are presented in Table 36. Fifty-four per cent of the group with class standing information available reported that they were "very certain" of their job choice; their mean academic average was 85.4. Thirty-three per cent checked that they were "fairly certain"; their mean was 83.5. Twelve per cent stated that they were "uncertain"; their mean was 81.5. The results from the analysis of variance of academic average by certainty of job choice are presented in Table 37. An F ratio of 5.1116 with 2/203 degrees of freedom was significant at the .01 level. There were significant differences in the means of academic average when compared by certainty of job choice. The students most certain of their job choice had the highest mean; those the least certain, the lowest mean score.

TABLE 34

Grade Point Averages when Students are Grouped by Attitudes toward School.

Feelings About School	N	Mean	STD DEV
Like very much	25	86.080	8.010
Like	48	85.083	6.937
OK	122	84.434	5.815
Dislike	15	82.733	5.587
Dislike very much	18	79.778	4.882
TOTAL	228	84.2719	6.2035

TABLE 35

Analysis of Variance: Grade Point Average by Attitudes Toward School

	SUM OF SQUARES	DEGRESS OF FREEDOM	MEAN SQUARE
BETWEEN GROUPS	517.3125	(4)	129.3281
WITHIN GROUPS	8735.6875	(223)	39.1735
TOTAL	9253.0000	(227)	

F = 3.3014 (.05)

TABLE 36 -

Means and Standard Deviations of Class Standings by Certainty of Job Choice

Certainty	N	Mean	Standard Deviation
Very certain	113	85.434	5.765
Fairly certain	68	83.485	6.779
Uncertain	25	81.520	5.917

TABLE 37

Analysis of Variance of Class Standing by Certainty of Job Choice

Source of Variation	Sum of Squares	d.f	Mean Square	F
Between groups	384.8125	2	192.4063	5.1116**
Within groups	7641.1875	203	37.6413	
TOTAL				

** Sig at .01 level

TABLE 38

Test Scales Which Tend to Discriminate
Between Programs of Enrollment

Test/Scale	Program Means Tending to be High	Program Means Tending to be Low
WVI		
Achievement	Distributive Ed.	Food Services
Surroundings	Conservation	Heating/Air Conditioning Machine Shop Electricity/Electronics
Altruism	Distributive Ed.	Electricity/Electronics
OVIS		
Machine Work	None	Distributive Ed. Data Processing
Personal Services	Food Services Distributive Ed. Data Processing	None
Care for People and Animals	Distributive Ed. Data Processing Food Services	None
Clerical Work	Food Services Data Processing Distributive Ed.	Machine Shop Auto Mechanics
Crafts	Electricity/Electronics	Data Processing Food Services Distributive Ed.
Customer Service	Data Processing Distributive Ed. Food Services	Auto Mechanics
Nursing	Distributive Ed. Data Processing Food Services	None
Skilled Personal Service	Food Services Distributive Ed. Data Processing	None

TABLE 38 (cont.)

Test/Scale	Program Means Tending to be High	Program Means Tending to be Low
OVIS (cont.)		
Training	Food Services	None
Literary	Food Services Distributive Ed.	None
Numerical	Data Processing Drafting Distributive Ed.	None
Appraisal	Drafting	None
Applied Technology	Drafting	Conservation
Promotion-Commercial	Distributive Ed.	None
Management	Distributive Ed.	None
Artistic	Food Services Distributive Ed. Drafting Data Processing	None
Sales Representative	None	Auto Mechanics Machine Shop
Entertainment	Distributive Ed.	None
Teacher-Counselor	Food Services Data Processing	None
CMI		
Attitude	Electricity/Electronics Data Processing	General Trades
ALP		
Word Meaning	Electricity/Electronics Drafting	General Trades Machine Shop
Word Categories	Electricity/Electronics Drafting	None

TABLE 38 (cont.)

Test/Scale	Program Means Tending to be High	Program Means Tending to be Low
ALP (cont.)		
Number Op. Reasoning	Electricity/Electronics Drafting	Building Trades Graphic
Word Cues	None	Auto Mechanics
Syntax Cues	Electricity/Electronics Drafting	Auto Mechanics General Trades

Data Summary

Included in Table 38 are those test scales toward which we would draw the reader's attention as holding some promise for differentiating among the various programs of study as indicated. Those scales for which there were significant F ratios across programs are listed as holding promise for further scrutiny. The program concomitants for each scale were identified by visual inspection of the program means by scale in relation to the total scale mean across programs. Those programs for which means tended to be outstandingly high or low are listed in the appropriate column. It is suggested that voc-tech school personnel at the local level may wish to make their own more particular studies of the usefulness of specific scales for their own needs. The scales identified herein are seen as starting points for such investigations.

CONCLUDING REMARKS

In conclusion, the results of this study support the hypothesis that standardized tests differentiate between students in various vocational training programs. The existence of real differences between various groups on certain characteristics raises some critical issues which might be categorized as "chicken or egg" questions. That is to say, "Which came first, the student characteristic or enrollment in the program?" For example, if the students in this study had been tested prior to their enrollment in a training program and grouped according to their intended field of study, would the Electricity/Electronics group have been significantly higher than the other groups on the Crafts interest scale of the OVIS? Or were all groups at relatively the same average score level prior to their training program, becoming more differentiated as an artifact of their particular program? The answers to questions such as these are of the utmost importance to the usefulness of test data for program selection purposes. If the situation is such that there is no relationship between a particular pre-enrollment characteristic, performance in the training program, or post-educational performance, then the variable being considered is invalid as a selection criterion. If, on the other hand, it is determined that certain pre-enrollment characteristics are related to various success criteria, then the variables tend to be valid for selection purposes. If this situation exists, significant differences on selected variables will also be observed for students enrolled in various programs; such results occurred in this study. These results are necessary but not sufficient for the validation of variables as selection criteria. The systematic differences observed in this study do, however, indicate that studies more rigorous and specific in nature are in order. Such studies should be longitudinal in nature, involving data gathered prior to, during, and following the vocational training experience. This exploratory research has indicated that intensive longitudinal studies are essential to a fuller and more

useful understanding of the relationships between student characteristics and salient outcomes of education.

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APPENDIX

STUDENT QUESTIONNAIRE

DIRECTIONS: Please answer the following questions in the space provided. Be as brief and accurate as possible and answer every question. Your answers may help us to better understand the factors which contribute to success in vocational programs.

Name:_____ Sex: Male___ Female___

Year in School: Fr___ So___ Jr___ Sr___ Age:_____yrs.

1. In what vocational program are you currently enrolled (Auto mechanics, building trades, electricity/electronics, etc.)?_____

2. What kind of job do you expect to obtain upon graduation?_____

3. How certain are you that you want to work at this job?

___a. Very certain

___b. Fairly certain

___c. Uncertain

4. What was your primary vocational aspiration during each of the following periods in your educational career?

Elementary grades_____
Junior High School_____
Senior High School_____

5. Have you actively prepared for vocation other than your current choice?

Yes___ No___ If Yes, what was the vocation?_____

6. What kind of work do your father and/or mother do?

Father's job_____

Mother's job_____

7. In general, how do you feel about school?

___a. Like school very much ___d. Dislike school

___b. Like school ___e. Dislike school very much

___c. It's OK

8. Do you have any plans for continuing your education beyond high school?

Yes___ No___ If Yes, please explain:_____

Thank you for your cooperation in this project!